

**EVALUATION OF PHYSICAL FITNESS, BIOCHEMICAL PARAMETERS AND OXIDATIVE STRESS STATUS BEFORE AND AFTER A 24-WEEK WORKPLACE PHYSICAL ACTIVITY INTERVENTION ON ADULT WOMEN OF AN ACADEMIC COMMUNITY.**

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**INTRODUCTION:** Workplace physical activity interventions (WPAI) are widely recognized for improving employees health, slowing down the ageing process (1) and boosting immunity through an increase in oxidative stress and antioxidant potential (2), but results remain inconsistent. The aim of this study was to evaluate the potential association between physical fitness (PF), biochemical parameters and oxidative stress status before and after a 24-week WPAI on adult women of a university community.

**METHODS:** Twenty-nine university female employee, aged  $50 \pm 13.5$  years, followed a 24-week WPAI consisting of two circuit training sessions and one mobility session per week. Physical fitness was evaluated as follows: cardiorespiratory fitness (CRF) with 2-min step test (2MST), upper limb strength with Handgrip test, upper body mobility with shoulder-neck test, core endurance with sit-up test, lower limb strength with jump and reach test, balance with one-leg stand test. Total

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cholesterol (TC), LDL-cholesterol (LDL-C) and glycemia were assessed before (T0), after 12 weeks (T1) and after 24 weeks (T2). Oxidative stress (d-ROMs test), PF and markers of antioxidant status (BAP test) were assessed at T0 and T2.

**RESULTS:** 2MST scores increased from  $78.8 \pm 16.6$  (baseline) to  $88.3 \pm 20.1$  (T2). At baseline, women with higher CRF values ( $\geq 65$  steps in 2MST) showed lower d-ROMs values ( $378.6 \pm 88.9$  vs  $472.6 \pm 118.8$  U-CARR) and higher BAP values ( $2729.3 \pm 537.4$  vs  $2073.0 \pm 933.4$   $\mu\text{mol/L}$ ), compared to those with lower CRF values ( $< 65$  steps in 2MST). TC, LDL-C and glycemia values decreased from baseline ( $199.5 \pm 41.1$ ,  $120.5 \pm 38.7$ ,  $90.6 \pm 18.0$  mg/dl) to T2 ( $181.2 \pm 33.5$ ,  $106.6 \pm 32.5$ ,  $82.2 \pm 9.6$  mg/dl) with  $p < 0.05$ ,  $< 0.01$ ,  $< 0.05$ , respectively. D-ROMs values ranged from  $410.4 \pm 104.4$  at T0 to  $464.0 \pm 116.4$  U-CARR at T2 ( $p < 0.01$ ) while BAP values ranged from  $2596.7 \pm 632.3$  at T0 to  $2727.5 \pm 569.1$   $\mu\text{mol/L}$  ( $p < 0.05$ ) at T2.

**CONCLUSION:** At baseline a higher CRF was positively associated with lower oxidative stress, suggesting that aerobic fitness may play a protective role. An adapted 24-week WPAI showed improvements in CRF, cholesterol and glycemia in blood samples and an improvement of the oxidative stress status. Specifically, although a significative increase of the ROMs was found, the WPAI may have led to an increase of the antioxidant potential, therefore contributing to boosting protection from absolute oxidative stress.

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2)Meng Q, Su CH. The Impact of Physical Exercise on Oxidative and Nitrosative Stress: Balancing the Benefits and Risks. *Antioxidants (Basel).* 2024;13(5):573. Published 2024 May 7. doi:10.3390/antiox13050573